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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/232,498	01/15/99	MIZUNO S	10517/16

IM52/0518

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EXAMINER	
RUTHKOSKY, M	
ART UNIT	**PAPER NUMBER**
1745	9

DATE MAILED: 05/18/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/232,498	Mizuno
Examiner	**Art Unit**
Ruthkosky, Mark	1745

-- The MAILING DATE of this communication appears on the cover she t with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Mar 6, 2001*

2a) ☒ This action is **FINAL.** 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-12* is/are pending in the applica

4a) Of the above, claim(s) _____ is/are withdrawn from considera

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-3, 5-8, 11, and 12* is/are rejected.

7) ☒ Claim(s) *4, 9, and 10* is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirem

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☒ All b) ☐ Some* c) ☐ None of:

1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

DETAILED ACTION

Summary

1. Claims 1-3, 5-8 and 11-12 stand rejected under 35 U.S.C. 103(a). The rejection of claims 1-12 under 35 U.S.C. 112, second paragraph have been overcome by the applicant's amendment. Claims 4, 9, and 10 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 U.S.C. § 112

2. The rejection of claims 1-12 under 35 U.S.C. 112, second paragraph, have been overcome by the applicant's amendment.

Claim Rejections - 35 U.S.C. § 103

3. Claims 1-3, 5-8 and 11-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Shigeta (4,956,131), in view of JP 59042781.

The instant claims are to a method of manufacturing a separator for a fuel cell comprising the steps of mixing a carbon, an epoxy resin and a phenolic resin, charging the material into a mold and heat pressing the material.

Shigeta (4,956,131) teaches a process for producing an electrode substrate for fuel cells which includes an electrode substrate and separator assembly where the process includes supplying materials into a mold comprising a filler (carbon particles of 50 microns or less), a binder (can be phenol resins, epoxy resins or mixtures thereof), and a pore regulator mixing and press molding the material (claims 1-4). While this process teaches the binder can be a mixture of phenol resins and epoxy resins, it does not teach a process for mixing both types or resins to form a separator (col. 20, line 10).

JP 59042781 (abstract), however, teaches a method for producing a carbon separator material for a fuel cell comprising the steps of mixing a carbon powder, an epoxy resin and a phenolic resin, charging the material into a mold and heat pressing the material. Novolac phenol resins are disclosed. The carbon is graphite less than 100 microns in size.

It would be obvious to one skilled in the art at the time the invention was made to combine the molding composition which is presented in JP 59042781 as the binder of Shigeta as the materials are well known to be mixed and bind carbon to form structures such as separators for fuel cells. The chemical resistance, heat resistance and gas impermeability of the material are improved. The use of such carbonaceous materials, is very well known in fuel cell assemblies.

As the epoxy resin is reacted with the phenolic resin, one of ordinary skill in the art would have the knowledge to choose to react the functional groups in about a 1:1 stoichiometry as the reaction will go to completion and form the desired product. It is also obvious to one of ordinary skill in the art to use cresol novolak and bisphenol A type epoxy resins as the epoxy

resin binder in a fuel cell, and resol phenolic resins as the phenol resin binder in a fuel cell. These specific resins are commonly used in the art as binders (see Hasegawa US 4,369,238, claim 2; and Sugaya US 5,128,378, col. 4, lines 60+ as examples.) for polymeric separators in electrochemical devices.

Allowable Subject Matter

4. Claims 4, 9, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The limitations in these dependent claims, including the use of glycidylamine as the epoxy resin, the method steps including particle sizes by spraying and drying and the step of grinding, are not taught with the process steps shown in the art. Thus, the claims are indicated as allowable.

Response to Arguments

5. Applicant's arguments filed 3/6/2001 have been fully considered but they are not persuasive.

The Shigeta (4,956,131) reference is used to show a process for producing an electrode substrate and separator assembly for fuel cells where the process includes supplying materials into a mold comprising carbon particles, a binder (can be phenol resins, epoxy resins or mixtures thereof), and a pore regulator mixing and press molding the material (claims 1-4). While this

process teaches the binder can be a mixture of phenol resins and epoxy resins, it does not specifically teach a process for mixing both types or resins to form a separator (col. 20, line 10).

Tsunoda (JP 59042781) is used to support the method of Shigeta as it also teaches a method for producing a carbon material separator for a fuel cell comprising the steps of mixing a carbon powder, an epoxy resin and a phenolic resin, charging the material into a mold and heat pressing the material. The specific method uses a vinyl phenol and a condensate having an epoxy group. These materials include the three components necessary in the mixture, carbon powder, an epoxy resin and a phenolic resin, and therefore, do support the Shigeta reference which teaches that the binder may be mixtures of phenol resins and epoxy resins in claim 1. The use of the epoxy and phenolic materials are known in the art as further supported by Hasegawa US 4,369,238, claim 2; and Sugaya US 5,128,378, col. 4, lines 60+ as examples. Thus, the rejections stand.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Examiner Correspondence

7. Any inquiry regarding this communication or a previous communication should be directed to Examiner Mark Ruthkosky, Ph.D., whose telephone number is (703) 305-0587 or his supervisor, Gabrielle Brouillette, Ph.D., whose phone number is (703) 308-0756. Please note that Examiner Ruthkosky is out of the office the first Friday of each bi-week period.

The art unit 1745 unofficial fax number is 703-306-3186, while the PTO official fax number is 703-305-3599.

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